APPENDIX A

GEOTECHNICAL REPORT

SUBSURFACE EXPLORATION REPORT
WATER TRANSMISSION SYSTEM DESIGN
N.E. 6TH AVENUE FROM N.E. 137TH ST TO N.E. 148TH ST
NORTH MIAMI, MIAMI-DADE, FL
DECEMBER 9, 2015
FILE NO.: 15-2640

OFFICES

Orlando, 8008 S. Orange Avenue, Orlando, Florida 32809, Phone (407) 855-3860
Bartow, 1525 Centennial Drive, Bartow, Florida 33830, Phone (863) 533-0858
Cocoa, 1300 N. Cocoa Blvd., Cocoa, Florida 32922, Phone (321) 632-2503
Fort Myers, 9970 Bavaria Road, Fort Myers, Florida 33913, Phone (941) 768-6600
Miami, 2608 W. 84th Street, Hialeah, Florida 33016, Phone (305) 825-2683
Port Charlotte, 740 Tamiami Trail, Unit 3, Port Charlotte, Florida 33954, Phone (941) 624-3393
Port St. Lucie, 460 Concourse Place NW, Unit 1, Port St. Lucie, Florida 34986, Phone (772) 878-0072
Sarasota, 78 Sarasota Center Blvd, Sarasota, Florida 34240, Phone (941) 922-3526
Tallahassee, 3175 W. Tharpe Street, Tallahassee, Florida 32303, Phone (850) 576-6131
Tampa, 3925 Coconut Palm Drive, Suite 115, Tampa, Florida 33619, Phone (813) 620-3389
West Palm Beach, 2200 N Florida Mango Road, Suite 101, West Palm Beach, Florida 33409, Phone (561) 687-8200

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

December 9, 2015
File No.: 15-2640

Ms. Alicia M. Vera-Feria, P.E.
Project Manager
Tetra Tech
150 West Flagler Street, Suite 1625
Fort Lauderdale, FL 33130

RE: SUBSURFACE EXPLORATION REPORT
WATER TRANSMISSION SYSTEM DESIGN
N.E. 6TH AVENUE FROM N.E. 137TH ST TO N.E. 148TH ST
NORTH MIAMI, MIAMI-DADE COUNTY, FL

As requested and authorized by you, we have completed a shallow subsurface soil exploration for the Water Transmission System Design project in the city of North Miami, FL. The purposes of performing this exploration were to evaluate the general subsurface conditions within the proposed force main alignment, as well as to provide recommendations for site preparation and foundation support. This report documents our findings and presents our engineering recommendations.

Site Location and Site Description

The site for the proposed water main replacement is located along N.E. 6th Avenue from N.E. 137th Street to N.E. 148th Street, North Miami, Miami-Dade, FL (Section 20, Township 52 S, Range 42 E). The existing water main alignment is currently part of utility corridors within the section of the road defined above.

Proposed Construction and Grading

It is our understanding that the proposed new Water Transmission System includes the installation of approximately 3600 linear feet of 12" DIP water main along N.E. 6th Avenue between N.E. 137th Street and N.E. 148th Street along with fire hydrant replacements and associated water service TIE-INS/Reconnections. The existing 6" diameter water main along N.E. 6th Avenue will be placed out of service.

Field Exploration Program

SPT Borings

The field exploration program consisted of performing seven (7) Standard Penetration Test (SPT) borings.

The SPT borings were performed within the proposed water main alignment or at the closest location allowed by existing utilities. The borings were advanced to depths of 15 feet below the ground surface using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in the Appendix. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory in sealed sample jars for further classification and laboratory testing.

Laboratory Testing Program

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were visually classified. The resulting soil descriptions are shown on the soil boring profiles presented in the Appendix.

General Soil Profile

The results of the field exploration and laboratory testing programs are graphically summarized on the soil borings presented in the Appendix. The stratification of the borings represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of our test borings indicate the following general soil profile:

Depth Below Ground Surface (feet)	Description
0 – 1.5	Fill, limerock, varies between medium dense to loose
1.5 – 7	Sand, medium dense, fine grained to limestone very poorly cemented
7 – 15	Limestone, to poorly cemented limestone

The above soil profile is outlined in general terms only. Please refer to the boring logs for soil profile details. As an exception to this general soil profile, boring B-7 encountered sand very loose fine grained from 7 to 14.5 feet, underlain by poorly cemented limestone to the boring termination depth.

Measured Groundwater Level

The groundwater level was measured in the boreholes on the day drilled after stabilization of the downhole water level. As shown on the boring logs, the measured groundwater levels were encountered at depths that ranged from 7.17 to 10 feet below the ground surface on the dates indicated. Fluctuations in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted.

Normal Seasonal High Groundwater Level

The normal seasonal high groundwater level each year is the level in the August-September period at the end of the rainy season. The water table elevations associated with a 100-year flood level would be much higher than the normal seasonal high groundwater level. The normal high water levels would more approximate the normal seasonal high groundwater levels.

The seasonal high groundwater level is affected by a number of factors. The drainage characteristics of the soils, the land surface elevation, relief points such as drainage ditches, lakes, rivers, swamp areas, etc., and distance to relief points are some of the more important factors influencing the seasonal high groundwater level.

Based on our interpretation of the site conditions using our boring logs, we estimate the normal seasonal high groundwater level at the site to be approximately at the groundwater levels measured at the time of our field exploration.

Pavement Cores

A total of seven (7) asphalt cores were retrieved from the project alignment to describe existing pavement structure. The cores were retrieved prior to drilling operations at the same location of soil borings. Results are presented in the table below:

Pavement Cores Results

Core	Asphalt Thickness (in)	Base Thickness (in)
C-1	3.5	16
C-2	2.5	12
C-3	4.5	13
C-4	4.0	22
C-5	4.5	13
C-6	5.5	18
C-7	4.5	18

Engineering Evaluation and Recommendations

General

The results of our exploration indicate that, with proper site preparation as recommended in this report, the existing soils are suitable for supporting the proposed water main and related structures.

The following are our recommendations for overall site preparation, foundation support, which we feel best suited for the proposed facility and existing soil conditions. The recommendations are made as a guide for the design engineer, parts of which should be incorporated into the project's specifications.

Excavations

Based on the conditions encountered during the field exploration, we anticipate that the surficial fill sand and limestone layers can be excavated with standard earth moving equipment, i.e., backhoes, front-end loaders, etc. The soils below the bottom of the excavations should be disturbed as little as possible by the excavation process.

The excavation should be safely braced to prevent injury to personnel or damage to equipment. Temporary safe slopes should be cut at a minimum in accordance with OSHA, 29 CFR Part 1926 Final Rule, Excavation Requirements. Flatter slopes should be used if deemed necessary. Surcharge loads should be kept at least 5 feet from excavations; spoil banks adjacent to excavations should be sloped no steeper than 2.0H to 1.0V.

The soils to be excavated are mainly sandy and may require temporary support depending on the depth and location of the excavation.

Dewatering

As per the information provided in project design submittal, the excavation of the proposed new water main will in the order off 5-6 feet of depth, rendering unnecessary the dewatering activities. However, if pipe elevation changes, then the control of the groundwater may be required to achieve the necessary depths of excavation and subsequent construction and backfilling and compaction requirements presented in the following sections. The actual method(s) of dewatering should be determined by the Contractor, however, regardless of the method(s) used, we suggest drawing down the water table sufficiently, say 2 to 3 feet, and below the bottom of the excavation to preclude "pumping" and/or compaction-related problems with the foundation spoils.

For relative comparison purposes only, we estimate that permeabilities within the first 8 feet are in the range of 10 to 300 ft. /day. Please notice that no field permeability tests were performed and the above estimated is providing as an approximate guide for dewatering purposes.

Pipeline Bedding

Borings' information indicate that the pipeline will be placed on an excavation within the limestone layer from N.E. 137th Street to N.E. 145th Street (Station 124+00) and within a sand layer from N.E. 145th Street to the end of the project at station 129+00 north of N.E. 147th Street. We recommend to use a gravel bedding considering the proximity to the water table and the difficulty of achieving proper compaction under those conditions.

Gravel will obtain adequate density as placed under, or above, the water table to support the proposed pipeline. Gravel could also be used for backfill between the bedding and the centerline of the pipe or up to 6 inches above water table elevation. Gravel size up to 2 inches may be used in bedding material. Compacted bedding should be compacted in accordance with the technical specifications for the project.

Backfill Requirements

Based on soil samples obtained during our subsurface investigation, the on-site surficial fill and very loose sands appear suitable for use as structural backfill for the pipe; however, material removed from below the water table will be wet and will require time to dry sufficiently. Silt and muck, or other imported soil material with fines with more than 10% by dry weight of material passing the U.S. Standard No. 200 sieve size, shall not be used as trench structural backfill.

The final backfill above the hunching or centerline of the pipe or water table must extend all the way to the trench walls and should be placed in level lifts not exceeding 8 inches. Each lift should be compacted to at least 95 percent of the maximum dry density, as determined by the Standard Proctor (ASTM D-698). Care should be taken not to damage the pipe or defect it by compacting directly above the pipe where there is sufficient cover material present. Minimum cover criteria should be in accordance with pipe manufacturer's recommendations.

A soil engineer or a designated representative from Ardaman & Associates, Inc. should observe and test all prepared and compacted areas to verify that all bedding, hunching and final backfill are prepared and compacted in accordance with the aforementioned specifications.

Resistance to Horizontal Forces on Pipeline Structures

Horizontal forces which act on structures such as thrust blocks can be resisted to some extent by the earth pressures that develop in contact with the buried vertical face (bearing vertical face is perpendicular and in front of the applied horizontal load) of the block structures and by shearing resistance mobilized along the base of the block structures and subgrade interface.

Allowable earth pressure resistance may be determined using an equivalent fluid density of 100 pounds per cubic foot (pcf) for moist soil and 60 pcf for submerged soils below the water table. The passive earth pressures are developed from ground surface to the bottom of the block structure.

The values presented above presume that the block structures are surrounded by well compacted sand backfill extending at least 5 feet horizontally beyond the vertical bearing face. In addition, it is presumed that the block structures can withstand horizontal movements on the order of one-quarter (1/4) to three-eighths (3/8) inch before mobilizing full passive resistance.

The sliding shearing resistance mobilized along the base of the block structure may be determined using an angle of internal friction of 32 degrees.

The vertical earth pressures developed by the overburden weight of soil can be calculated using the following unit weights:

- Compacted moist soils = 110 pcf
- Saturated soil = 120 pcf

Foundation Support and Estimated Settlements for Structures

The permanent structures such as concrete manholes, anchor blocks, air release valves, blow offs, etc., can be designed for an allowable soil bearing pressure of 2000 pounds per square foot (psf) if bearing on the natural sand or compacted backfill; this value assumes compaction of 95 percent of the standard Proctor maximum density (ASTM D-698, AASHTO T-99) for a depth of one foot below the structure.

When silt and organic silt are found at a specific location, the area shall be over-excavated a minimum of 24 inches and backfilled to the required bearing level using free draining gravel. Ardaman & Associates, Inc. shall be called to observe conditions at such locations and modify these recommendations if required.

Pipe settlement during and after construction should be negligible, provided the bedding and backfilling criteria in the above sections are satisfied. The volume of soil displaced by the pipe, compared to the weight of the pipe when full will result in little if any net increase in bearing stress to the subsurface soils.

Uplift Resistance

Permanent structures submerged below the water table will be subjected to uplift forces caused by buoyancy. The components resisting this buoyancy include: 1) the total weight of the pipe or structure divided by an appropriate factor of safety; 2) the buoyant weight of soil overlying the pipe or structure; and 3) the shearing forces that act on shear planes that radiate vertically upward from the perimeter of the pipe or the edges of the structure to the ground surface.

The allowable unit shearing resistance may be determined using the same unit weights and friction angle recommended above and a coefficient of earth pressure at rest of 0.43.

The values given for the above parameters assume that the permanent structures are covered by clean, well compacted granular backfill that extends horizontally at least 2 feet beyond the structures.

At-Rest Earth Pressures Acting on Manhole Structures

At-rest earth pressure acting on the manhole structures include lateral loading. The lateral earth pressure will be a function of both the soil unit weight (submerged or moist) and the depth below ground surface. Soil parameters given above for the horizontal forces and uplift resistance can be used in these structures.

Earth Pressure on Shoring and Bracing

If temporary shoring and bracing is required for any excavation, the system should be designed to resist lateral earth pressure from the sandy soils.

The design earth pressure will be a function of the flexibility of the shoring and bracing system. For a flexible system restrained laterally by braces placed as the excavation proceeds, the design earth pressure for shoring and bracing can be computed using a uniform earth pressure distribution with depth. It is recommended that soils be dewatered around the excavations. For such de-watered excavations, we recommended using the following uniform pressure distribution over the full brace height as follows:

Uniform Soil Pressure Distribution, $p=0.65\ K_a y_s H$

Where:
p = uniform pressure distribution for design of braced excavation
K_a = coefficient of active earth pressure = 0.33
Y_s = unit weight of saturated soils = 120 pcf
H=depth of excavation

An appropriate factor of safety should be applied for the design of the braced excavations.

Lateral pressure distributions determined in accordance with the above do not take hydraulic pressures or surcharge loads into account. Where applicable, they should be incorporated in the design. Construction equipment and excavated fill should be kept a minimum distance of 5 feet from the edge of the braced or shore excavation. Backfill material placed adjacent to (maintaining minimum 5-foot horizontal clearance) the braced or shored excavations should have a minimum slope of 2.0H: 1.0V, or flatter if required by the site specific conditions and/or to meet OSHA requirements.

Quality Assurance

We recommend establishing a comprehensive quality assurance program to insure that all excavation, bedding and backfilling are conducted in accordance with the appropriate plans and specifications. Materials testing and inspection services should be provided by Ardaman & Associates. As a minimum, an in-situ density tests should be conducted every 150 feet and for each lift during backfilling activities to check the required densities. In-situ density values should be compare to laboratory Proctor moisture-density results for each of the different natural and fill soils encountered. Also, we recommend inspecting and testing the construction materials and other structural components.

Closure

The analysis and recommendations submitted herein are based upon the data obtained from the soil borings presented in the Appendix and the assumed loading conditions. This report does not reflect any variations which may occur adjacent to or between the borings. The nature and extent of the variations between the borings may not become evident until during construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented in this report after performing on-site observations during the construction period and noting the characteristics of the variations.

This report has been prepared for the exclusive use of Tetra Tech in accordance with generally accepted soil and foundation engineering practices. In the event any changes occur in the design, nature, or location of the proposed facility, we should review the applicability of conclusions and recommendations in this report. We also recommend a general review of final design and specifications by our office to make sure that earthwork and foundation recommendations are properly interpreted and implemented in the design specifications.

We are pleased to be of assistance to you on this phase of your project. When we may be of further service to you or should you have any questions, please contact us.

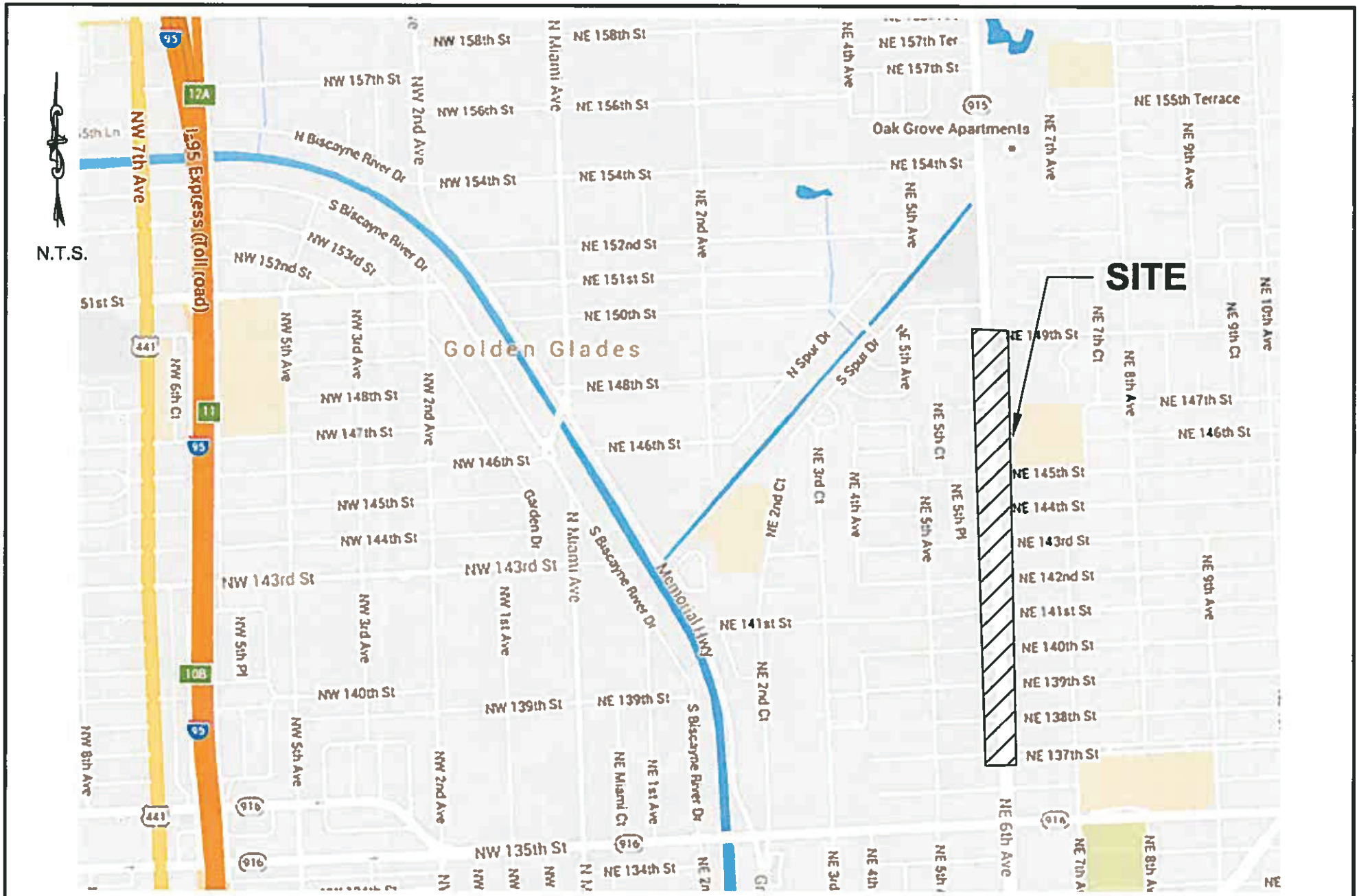
Very truly yours,
ARDAMAN & ASSOCIATES, INC.
A Tetra Tech Company
FL Certificate No. 0005950

12/30/15

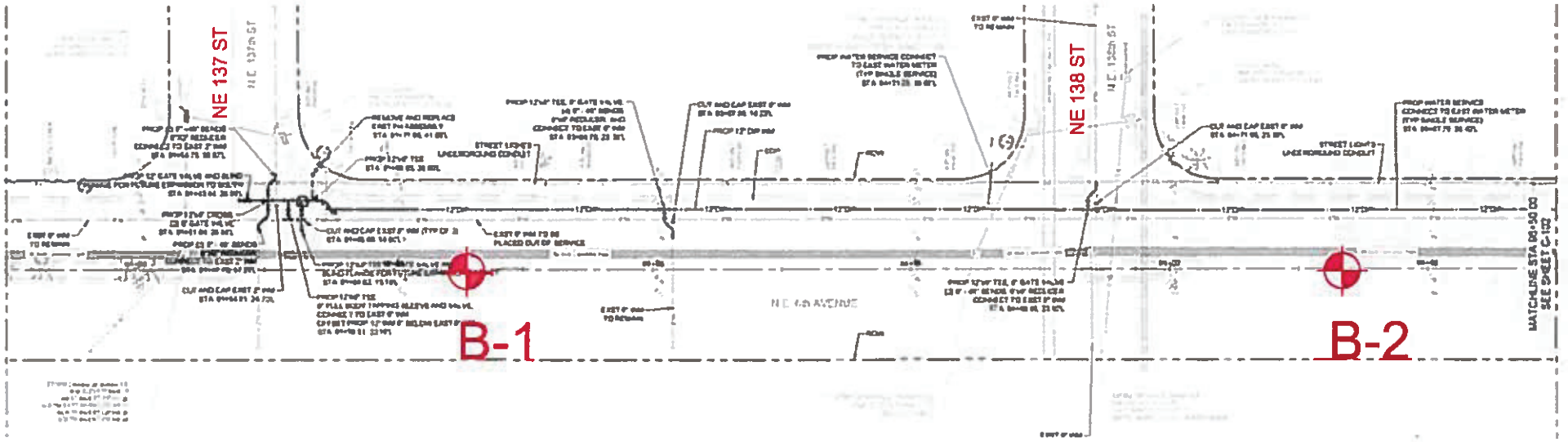
Evelio Horta, Ph.D., P.E., G.E.
Senior Geotechnical Engineer
FL Reg. No. 46625

Evelio Horta Jr., M.S.C.E.
Staff Engineer

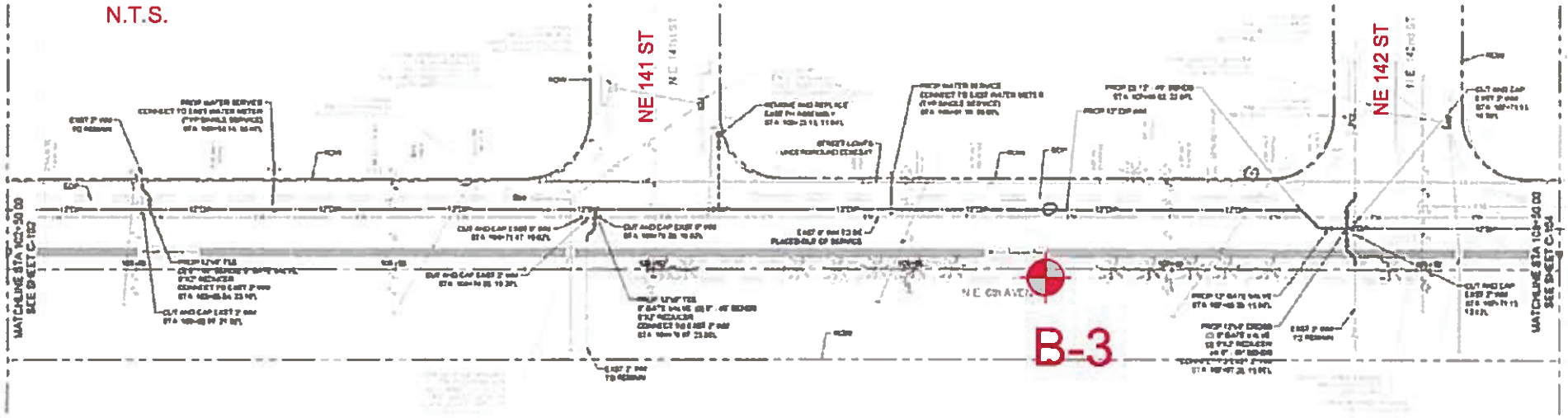
SITE PLAN
and
BORING LOGS



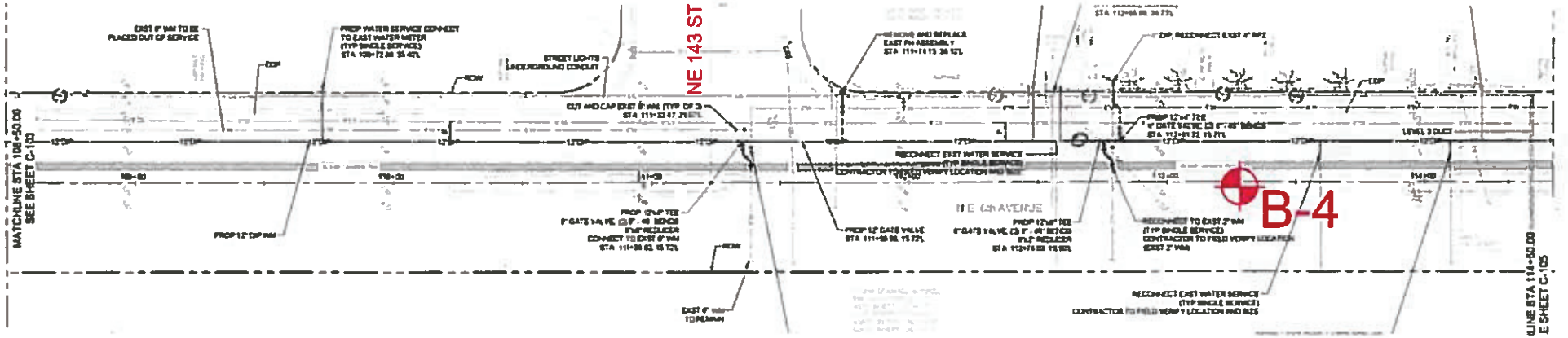
Ardaman & Associates, Inc. Geotechnical, Environmental and Materials Consultants	SUBSURFACE EXPLORATION PROPOSED WATER TRANSMISSION SYSTEM DESIGN ALONG NE 6tH AVE FROM 137th TO 149th STREET, NORTH MIAMI MIAMI DADE COUNTY, FLORIDA	SITE VICINITY MAP Figure No 1.	File No.: 15-2640 Prepared By: EHJr Date: 12/11/15



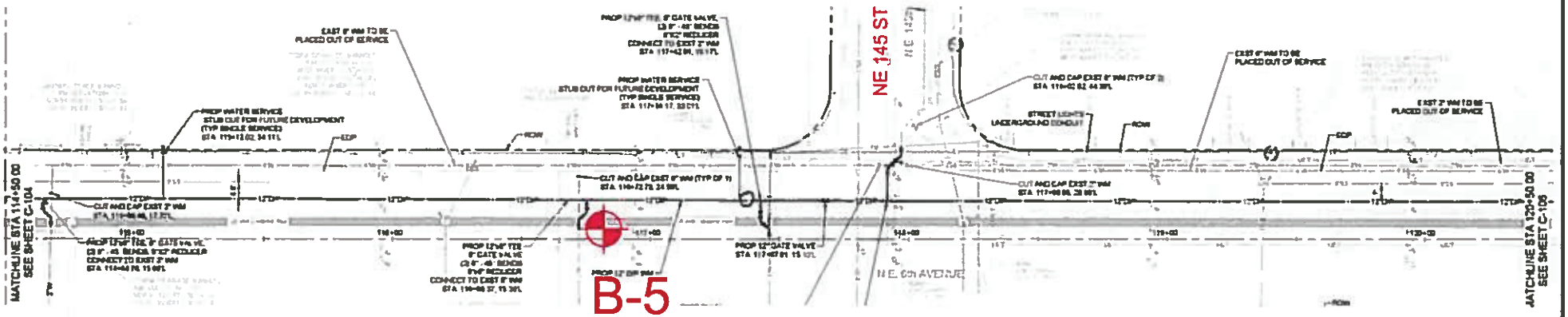
N.T.S.



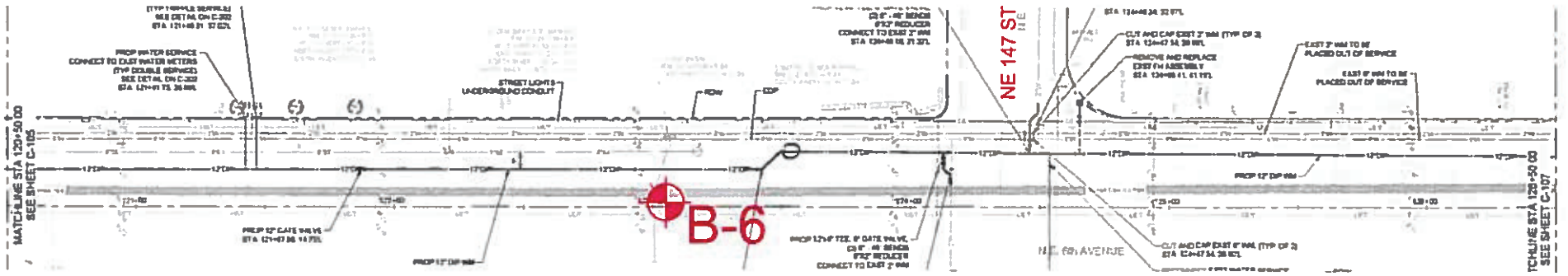
Ardaman & Associates, Inc. Geotechnical, Environmental and Materials Consultants	SUBSURFACE EXPLORATION PROPOSED WATER TRANSMISSION SYSTEM DESIGN ALONG NE 6tH AVE FROM 137th TO 149th STREET, NORTH MIAMI MIAMI DADE COUNTY, FLORIDA	BORING LOCATION PLAN Figure No 2.	File No.: 15-2640 Prepared By: EHJr Date: 12/11/15



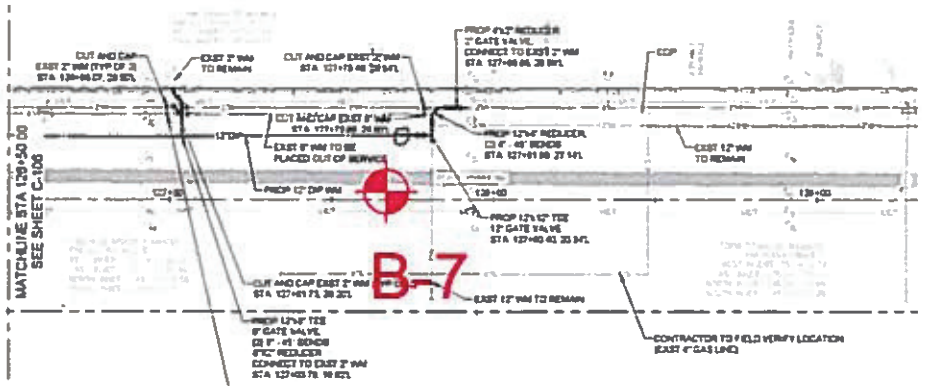
N.T.S.



Ardaman & Associates, Inc. Geotechnical, Environmental and Materials Consultants	SUBSURFACE EXPLORATION PROPOSED WATER TRANSMISSION SYSTEM DESIGN ALONG NE 6tH AVE FROM 137th TO 149th STREET, NORTH MIAMI MIAMI DADE COUNTY, FLORIDA	BORING LOCATION PLAN Figure No 3.	File No.: 15-2640 Prepared By: EHJr Date: 12/11/15



N.T.S.



Ardaman & Associates, Inc. Geotechnical, Environmental and Materials Consultants	SUBSURFACE EXPLORATION PROPOSED WATER TRANSMISSION SYSTEM DESIGN ALONG NE 6tH AVE FROM 137th TO 149th STREET, NORTH MIAMI MIAMI DADE COUNTY, FLORIDA	BORING LOCATION PLAN Figure No 4.	File No.: 15-2640 Prepared By: EHJr Date: 12/11/15

APPENDIX

STANDARD PENETRATION TEST BORING LOGS

Our borings describe subsurface conditions only at the locations drilled and at the time drilled. They provide no information about subsurface conditions below the bottom of the boreholes. At locations not explored, surface conditions that differ from those observed in the borings may exist and should be anticipated.

The information reported on our boring logs is based on our drillers' logs and on visual examination in our laboratory of disturbed soil samples recovered from the borings. The distinction shown on the logs between soil types is approximate only. The actual transition from one soil to another may be gradual and indistinct.

The groundwater depth shown on our boring logs is the water level the driller observed in the borehole when it was drilled. These water levels may have been influenced by the drilling procedures, especially in borings made by rotary drilling with bentonitic drilling mud. An accurate determination of groundwater level required long-term observation of suitable monitoring wells. Fluctuations in groundwater levels throughout the year should be anticipated.

The absence of a groundwater level on certain logs indicates that no groundwater data is available. It does not mean that no groundwater will be encountered at the boring location.

STANDARD PENETRATION TEST BORINGS

The Standard Penetration Test is a widely accepted method of testing foundation soils in place. The N-Value obtained from the test has been correlated empirically with various soil properties. These empirical correlations allow satisfactory estimates to be made of how the soil is likely to behave when subjected to foundation loads. Tests are usually performed in the boreholes at intervals of five feet. In addition, our Firm performs tests continuously in the interval directly below the expected foundation bearing grade where the soils will be most highly stressed.

Boreholes where Standard Penetration Tests will be performed are drilled with a truck-mounted CME 45A drill rig. The boreholes are advanced by rotary drilling with a winged bit that makes a hole about three inches in diameter. A bentonitic drilling mud is recirculated in order to remove the cuttings and support the walls of the borehole. The drag bit is specially modified to direct the mud upward and reduced disturbance of the soil ahead of the bit.

Occasionally, running or squeezing ground is encountered that cannot be stabilized by the drilling mud alone. In addition, drilling mud may be lost into the soil or rock strata that are unusually pervious. In such cases, flush-coupled steel casing with an outside diameter of about 3.5 inches is driven as a liner for the borehole.

After the borehole has been advanced to the depth where a Standard Penetration Test will be performed, the soil sampler used to run the test is attached to the end of the drill rods and lowered to the bottom of the borehole. The testing procedure used conforms closely to the methods recommended in ASTM D-1586. The sampler used has a split-barrel 24 inches long and an outside diameter of 2.0 inches. It is driven into the ground below the bottom of the borehole using a hammer that weighs 140 pounds and falls 30 inches. The driller records the number of hammer blows need to advance the sampler the second and third six-inch increments constitutes the test result; that is, the N-Value at the depth. The test is completed after the sampler has been driven not more than 24 inches or when refusal is encountered, whichever occurs first. Refusal occurs when 50 hammer blows advance the sampler six inches or less. After the test is completed, the sampler is removed from the borehole and opened.

The driller examined and classified the soil recovered by the sampler. He places representative soil specimens from each test in closed glass jars and takes them to our laboratory. In the laboratory, additional evaluations and tests are performed, if needed. The driller's classifications may be adjusted, if necessary, to conform more closely to the United Soil Classification systems, ASTM D-2487. Jar samples are retrained in our laboratory for sixty days, then discarded unless our clients request otherwise.

After completion of a test boring, the water level in the borehole is recorded.

STANDARD PENETRATION TEST BORING LOG

BORING 1

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 7.92'

DATE DRILLED: 12/2/15

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE
	47/6 22/6 14/6	FILL, limerock (base thickness 16"),white Upper 3" Asphalt	1	36
		SAND, medium dense, fine grained, brown	2	18
5	9/6 9/6 9/6 4/6 2/6 4/6	SAND, loose fine grained, dark brown	3	6
	1/6 0/6 0/6	LIMESTONE, very poorly cemented, with silty voids, brown	4	0
10	1/6 2/6 2/6 2/6 4/6 4/6 4/6 4/6 6/6	LIMESTONE, poorly cemented, pale brown to white	5	4 8 10
15	6/6 6/6 6/6			12
20				
25				
30				
35				

N VALUE
5 10 15 20 25 30 35 40 45

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

STANDARD PENETRATION TEST BORING LOG

BORING 2

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 7.17'

DATE DRILLED: 12/2/15

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE
0	50/6 22/6 6/6	FILL, limerock (base thickness 12") Upper 2" Asphalt	1	28
		SAND, medium dense fine grained, brown	2	
		LIMESTONE, very poorly cemented, with large pockets of sand, yellow	3	10
5	6/6 5/6 5/6			
	2/6 2/6 2/6			4
	1/6 2/6 2/6	LIMESTONE, poorly cemented (oohite), white	4	4
	1/6 2/6 2/6			4
10	1/6 2/6 1/6			3
	2/6 1/6 2/6			3
15	2/6 2/6 2/6			4
20				
25				
30				
35				

N VALUE: 5 10 15 20 25 30 35 40 45

NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

STANDARD PENETRATION TEST BORING LOG

BORING 3

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

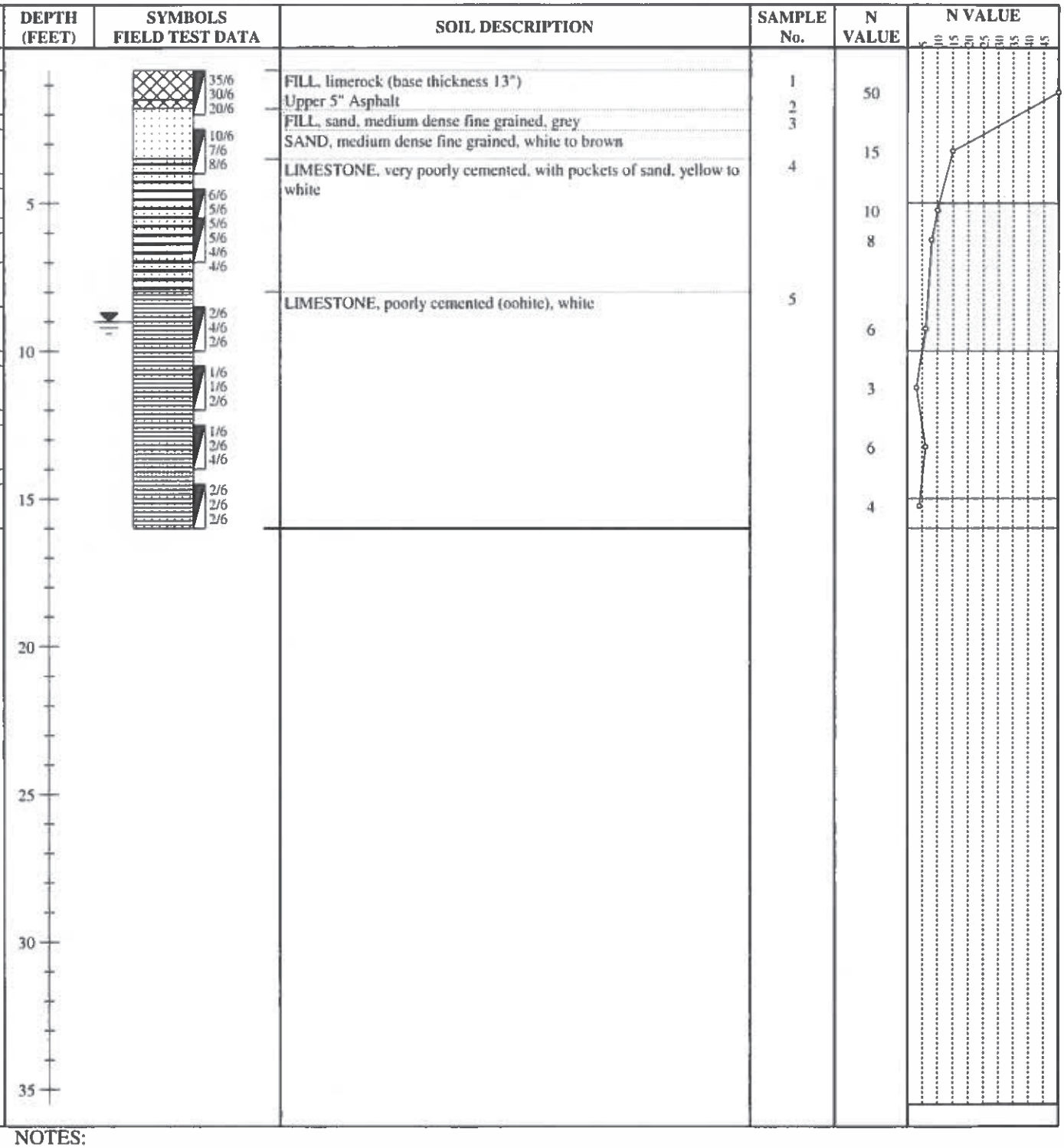
FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 9'

DATE DRILLED: 12/2/15



NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

STANDARD PENETRATION TEST BORING LOG

BORING 4

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

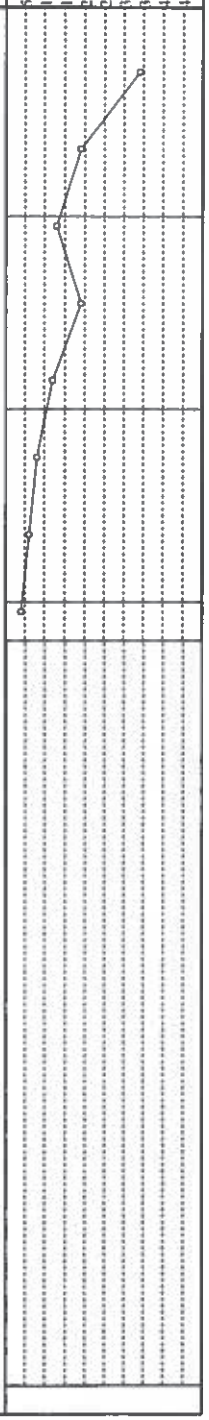
DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 10.67'

DATE DRILLED: 12/2/15

DEPTH (FEET)	SYMBOLS FIELD TEST DATA	SOIL DESCRIPTION	SAMPLE No.	N VALUE
	33/6 19/6 15/6	FILL, limerock, white Upper 4" Asphalt	1	34
	14/6 10/6 9/6	LIMESTONE, very poorly cemented, with large pockets of sand	2	19
5	5/6 6/6 7/6	LIMESTONE, yellow to white	3	13
	5/6 9/6 10/6	LIMESTONE, white	4	19
	6/6 7/6 5/6			12
10	2/6 4/6 4/6			8
	2/6 4/6 2/6			6
15	2/6 2/6 2/6			4
20				
25				
30				
35				

N VALUE



NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

STANDARD PENETRATION TEST BORING LOG

BORING 5

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

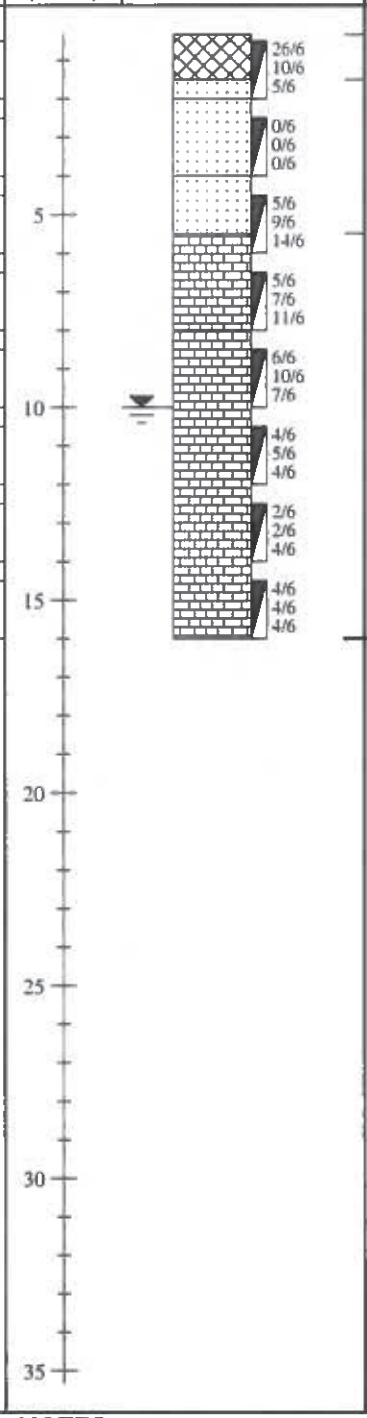
FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 10'

DATE DRILLED: 12/2/15



NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

STANDARD PENETRATION TEST BORING LOG

BORING 6

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

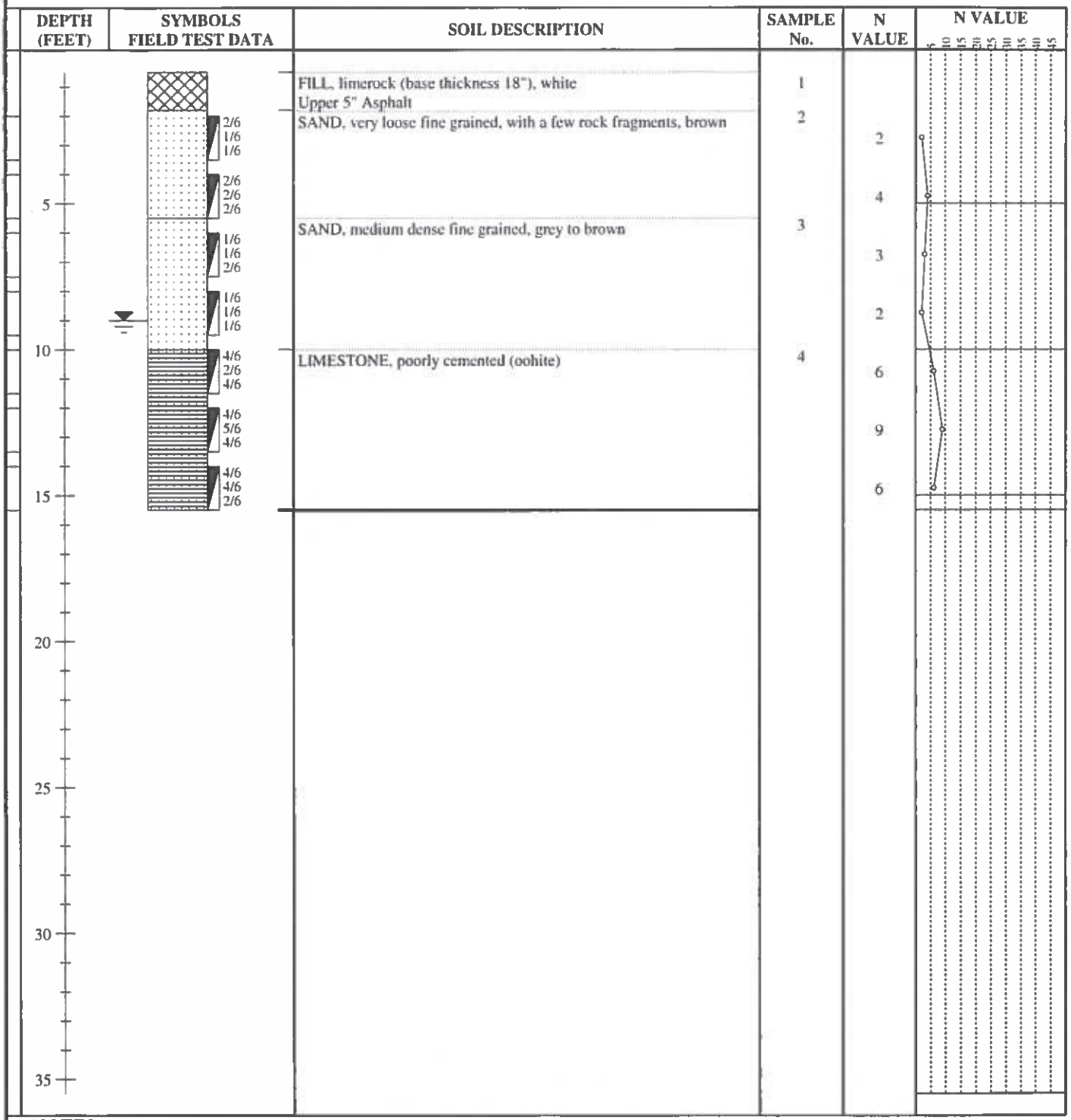
FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 9'

DATE DRILLED: 12/2/15



NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)

STANDARD PENETRATION TEST BORING LOG

BORING 7

PROJECT: CONM WSF WORK PLAN UPDATE
N.E. 6th Ave from N.E. 148th Street to 13th Street, North Miami, FL

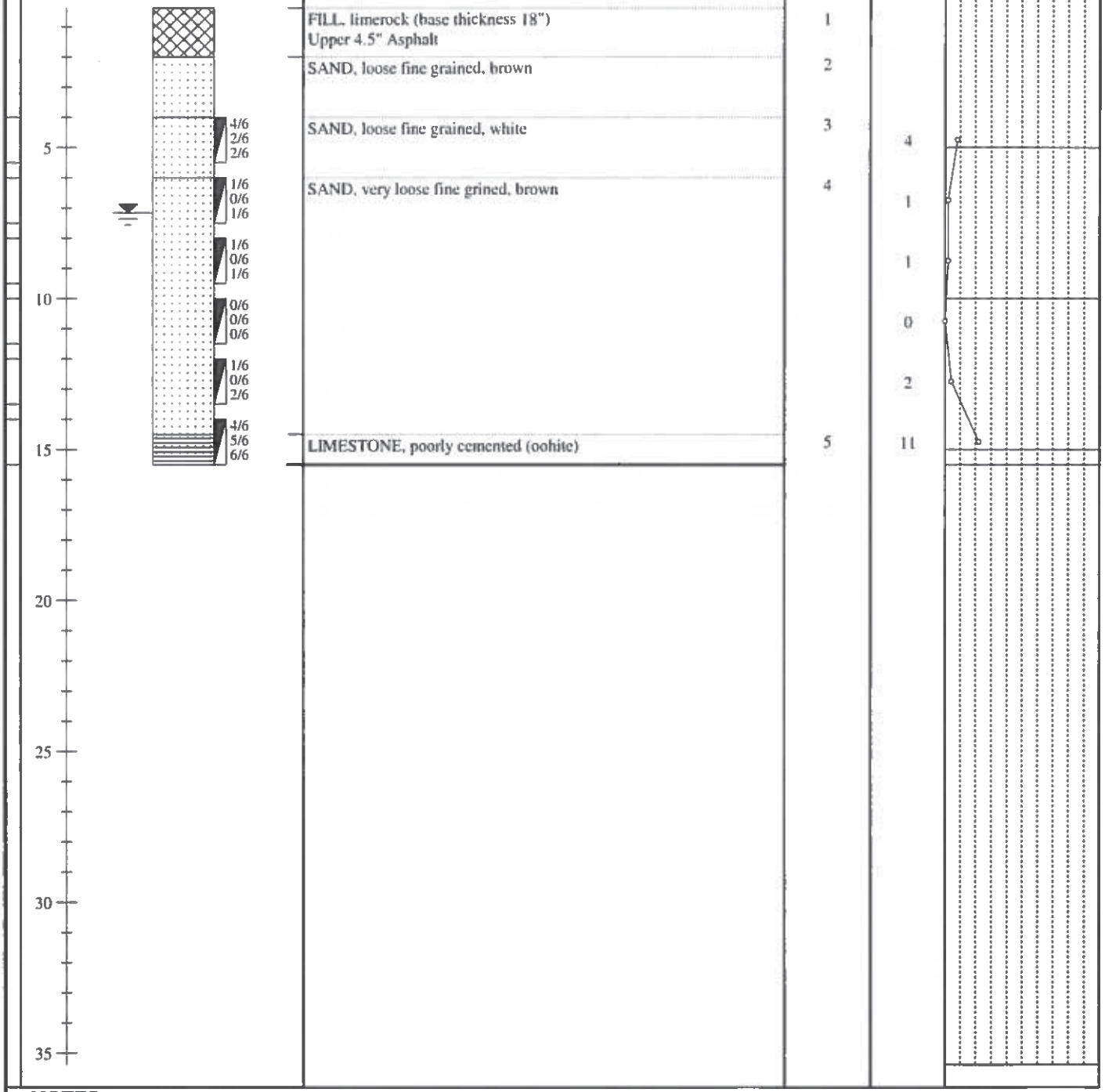
FILE No.: 113-15-48-2640

BORING LOCATION: SEE PLAN

DRILL CREW: EG/FCH

WATER OBSERVED AT DEPTH 7.17'

DATE DRILLED: 12/2/15



NOTES:

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN" 140-LB HAMMER, 30-INCH FALL. (ASTM D-1586)